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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,478	06/20/2000	Rakemdra Kumar Bera	JP9-1999-0272US1	5293

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EXAMINER	
DO, CHAT C	
ART UNIT	**PAPER NUMBER**
2124	7

DATE MAILED: 04/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/597,478	Applicant(s) BERA, RAKEMDRA KUMAR
	Examiner Chat C. Do	Art Unit 2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/20/00;8/6/02;1/2/03;1/22/03* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, the limitations "the equivalence" in line 1, "the form" in line 8, and "the products" in line 12 lack antecedence basis. For examination purposes, the examiner considers these limitations as "an equivalence" in line 1, "a form" in line 8, and "a products" in line 12. Claims 4, 7, 10, and 14 have the same problem. Thus, claims 2, 5, 8, and 11-12 are also rejected for being dependent on the rejected based claims 1, 4, 7, 10, and 14.

Re claim 3, the limitation "the ordered operands" in line 5 lacks an antecedence basis. For examination purposes, the examiner considers this limitation as "the operands" in line 5. Claims 6 and 9 have the same problem.

Re claim 13, the limitation "the total number of sets" in line 2 lacks an antecedent basis. For examination purposes, the examiner considers this limitation as "a total number of sets" in line 2.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-3, 10-13, and 14 clearly recite a computer related method for determining an equivalence of a set of simultaneous linear algebraic equations according to a mathematical algorithm. Claims 4-6 and 7-9 recite a computer apparatus and computer program product implementing the above method but fail to limit the apparatus to any particular structure other than a general computer with input, memory, and processing device. Indeed, any apparatus used to implementing the underlined method would result in an apparatus as claimed. In order for such a claimed to be statutory, the claims must include either a step that results in a physical transformation outside the computer or a limitation to a practical application. It is clear from claims 1-14 that the claims merely recite data computation and manipulation steps in performing a mathematical function. The inputs are numbers and the outputs are also numbers. The claims fail to recite any step that results in a physical transformation outside the computer or include a limitation to practical application. Accordingly, claims 1-14 are clearly directed to a non-statutory subject matter.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being obvious over Press et al. ("Numerical Recipes in FORTRAN") in view of Hayami et al. (U.S. 5,200,915).

Re claim 1, Press et al. disclose a computer implemented method of determining the solutions of a set of simultaneous linear algebraic equations, each of equations being of a form: $e_{i1}x_1 + e_{i2}x_2 + e_{i3}x_3 + \ldots + e_{in}x_n = b_i$ (page 22 equation 2.0.1) wherein x_j are unknown, e_{ij} are coefficients, and b_i are quantities (page 22 lines 7-9), coefficients and quantities being known algebraic expressions method comprising the steps of: iteratively eliminating unknowns from each of sets of simultaneous linear algebraic equations until each of equations are in the form: $(l_{ii})_k\ x_i = (r_i)_k$ (page 33-34 particularly equations 2.2.1, 2.2.2, and 2.2.4) wherein l_{ii} (α_{44}) and r_i (b_{44}) are algebraic expressions. Press et al. do not discloses a method of comparing for each of unknowns the products $(l_{ii})_1 * (r_i)_2$ and $(l_{ii})_2 * (r_i)_1$ wherein first and second set of simultaneous linear algebraic equations are equivalent if products match for all unknowns. However, Hayami et al. disclose a function manipulation using the associate law in the equations 19 and 20. In addition, Hayami et al. disclose that the result of x' can be computed or compared by multiplying M and y'. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to use the comparing method of Hayami et al.

(equations 19 and 20 in col. 9) in Press et al.'s invention to determine the equivalent of a set equations by comparing each solution of one set to one of corresponding set because the combined method of Hayami et al.'s invention in Press et al. 's invention would enable to simplify the system process and reduce the hardware.

Re claim 2, Press et al. further disclose the initial steps of: recasting algebraic expressions (equations 2.0.1 page 22) into a form of one or more token pairs arranged sequentially in a string (page 23 line 40-43), each token pair comprising an operator followed by an operand (a_{ii}); and reducing strings in accordance with a set of predetermined simplifying rules to obtain reduced expressions; and wherein eliminating step is performed on reduced strings in accordance with a set of predetermine operations (pages 33-34 using Gaussian Elimination with Back-Substitution operation to reduce equations as seen in 2.2.1).

Re claim 3, Press et al. further disclose simplifying rules in page 35 comprising the step of: arranging token pairs into subgroups (2.3.2); arranging operand tokens in an arranged subgroup in order (2.3.2); reducing the ordered operands by consolidating one or more constants and eliminating variables of opposite effect to form reduced subgroups; and consolidating one or more multiple instance of similar subgroups to produce a reduced string (equations 2.3.4-2.3.7).

Re claim 4, it is an apparatus claim of claim 1. Thus, claim 4 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 5, it is an apparatus claim of claim 2. Thus, claim 5 is also rejected under the same rationale in the rejection of rejected claim 2.

Re claim 6, it is an apparatus claim of claim 3. Thus, claim 6 is also rejected under the same rationale in the rejection of rejected claim 3.

Re claim 7, it is a program claim of claim 1. Thus, claim 7 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 8, it is a program claim of claim 2. Thus, claim 8 is also rejected under the same rationale in the rejection of rejected claim 2.

Re claim 9, it is a program claim of claim 3. Thus, claim 9 is also rejected under the same rationale in the rejection of rejected claim 3.

Re claim 10, it is a general method claim of claim 1. Thus, claim 10 is also rejected under the same rationale in the rejection of rejected claim 1.

Re claim 11, it is a general method claim of claim 2. Thus, claim 11 is also rejected under the same rationale in the rejection of rejected claim 2.

Re claims 12-13, they are general method claims of claim 2. Thus, claims 12-13 are also rejected under the same rationale in the rejection of rejected claim 2.

Re claim 14, it is a general method claim of claim 1. Thus, claim 14 is also rejected under the same rationale in the rejection of rejected claim 1.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 5,392,429 to Agrawal et al. disclose a method of operating a multiprocessor computer to solve a set of simultaneous equations.

b. U.S. Patent No. 6,144,932 to Hachiya discloses a simulation device an its method for simulating operation of large scale electronic circuit by parallel processing.

c. U.S. Patent No. 3,621,209 to Peter discloses a machine-implemented processor for insuring the numerical stability of Gaussian Elimination.

d. U.S. Patent No. 5,442,569 to Osano discloses a method and apparatus for systems characterization and analysis using finite element methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Chat C. Do
Examiner
Art Unit 2124

March 31, 2003

CHUONG DINH NGO
PRIMARY EXAMINER